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Sensory aids for the blind: A challenging problem with lessons for the future

Nye, Patrick W. and Bliss, James C. (1970) *Sensory aids for the blind: A challenging problem with lessons for the future*. Proceedings of the IEEE, 58 (12). pp. 1878-1898. ISSN 0018-9219.

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Abstract

The two major objectives of sensory aids for the blind are to permit access to printed matter and to permit safe travel through the environment. The difficulties of designing technological means to achieve these objectives are in many respects unrelated to the concerns of the engineering laboratory. Social, economic, political, and logistic considerations all play a role. The "blind population" in the United States includes both the totally blind and those with a wide range of visual impairment. This population totals about 400 000 people in which the aged, the multiply handicapped, and those with significant residual vision predominate. Singly handicapped, working-aged people are the initial targets of the current sensory aids. Expansion of their range of usefulness to larger fractions of the blind population is expected to come later. About 800 agencies serve the blind population in the United States, and in 1967 they were responsible for an annual expenditure of 1 million. Nevertheless, several potentially useful prototype devices have been developed and are about to be evaluated in this country; at least one is of foreign origin. But if these devices are ever to have the opportunity of reaching the blind public, then mechanisms for evaluation, field trials, manufacture, and deployment must be set up. The field of currently active sensory-aids research programs is reviewed. Several programs are concerned with increasing the convenience and accessibility of braille by the application of computer technology. Nevertheless, despite the unquestionable value of these developments, the usefulness of braille is limited by its bulk, its cost, and the transcription time. To provide direct access to printed documents several devices are being developed that transform optical images from a printed page into auditory or tactile displays requiring motivation and training for effective use. These machines are termed "direct-translation" units and are designed for simplicity and low cost. Other systems utilize print recognition techniques to create a reading machine providing braille or speech as an output. These machines offer potentially faster reading rates and their use promises to be easier to learn than direct-translation machines, but at the penalty of complexity and high cost. Several mobility aids designed to augment the cane or guide dog have recently been developed. These are also described. The prospects of achieving direct input to the visual cortex are discussed. It is apparent that the cost of this research is likely to be extremely high in relation to the size of the blind population which might ultimately benefit. Somewhat more easily realizable is a visual substitution system involving stimulation of an area of the skin. Several systems are being developed but all suffer from limitations in image resolution. Finally, an examination of the organization of research and funding reveals that the U.S. program is small, poorly coordinated, and contains some seemingly unnecessary duplication of effort. Several obvious lessons emerge which, if heeded, could greatly improve the effectiveness of sensory-aids research by providing development, manufacture, evaluation, and deployment services within an integrated program.

Item Type:	Article		
Related URLs:	URL	URL Type	Description
	https://doi.org/10.1109/PROC.1970.8061	DOI	Article
	http://ieeexplore.ieee.org/document/1449991/	Publisher	Article
Additional Information:	© 1970 IEEE. Invited paper. Manuscript received June 1, 1970; revised September 2, 1970.		
Record Number:	CaltechAUTHORS:20170810-170802541		
Persistent URL:	http://resolver.caltech.edu/CaltechAUTHORS:20170810-170802541		
Official Citation:	P. W. Nye and J. C. Bliss, "Sensory aids for the blind: A challenging problem with lessons for the future," in Proceedings of the IEEE, vol. 58, no. 12, pp. 1878-1898, Dec. 1970. doi: 10.1109/PROC.1970.8061		
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define haptic wearables as untethered, ungrounded body worn devices that interact with skin directly or through clothing and can be used in natural environments outside a laboratory. Results of this review are categorized by degree of sensory impairment. Abstract. Sensory impairments decrease quality of life and can slow or hinder rehabilitation. Small, computationally powerful electronics have enabled the recent development of wearable systems aimed to improve function for individuals with sensory impairments. The purpose of this review is to synthesize current haptic wearable research for clinical applications involving sensory impairments. The following case study is written by Irina Germanova Sumarokova, director of Nizhniy Novgorod Regional Charity of Parents of Visually Impaired "Perspektiva." Establish a model of early intervention center for providing permanent medical, social psychological and pedagogic services for families with blind or visually impaired children in Nizhniy Novgorod Irina Germanovna Sumarokova Director Nizhniy Novgorod... Now days the number of blind and visually impaired children is increasingly growing. The situation is worsened by fact, that last few years as a result of medical successes in nursing of premature newborn children a number of multi-disabled children with blindness increased too. Creating an inclusive learning experience for English language learners with specific needs: Case studies from around the British Council's global network. www.teachingenglish.org.uk. Contents. Case studies sensory and physical needs 17. Case study 7. Khalid – Physical impairment 18 Case study 8. Eman – Hearing impairment 19 Case study 9. Mariam – Hearing impairment 20 Case study 10. Juan – Hearing impairment 21 Case study 11. The British Council is committed to providing its learners with a structured English language learning experience that will support each individual in the process of reaching their full potential in language learning.